December 7, 1830, saw a very bright patch of double the dimensions of the moon's disc, moving with great velocity behind the common auroral beams. Further, Prof. Bischoff, in Burgbrohl (p. 461), observed, on the occasion of the aurora of January 7, 1831, a moving cloud as bright as the milky way, from E. to W., in five minutes. Prof. Moll saw, in Utrecht a similar object, rising from N.E., through the Pleiades, to S.E. (S.W.?). Similar observations are to be found during the same aurora, p. 471 (one advancing arch), p. 472 (four similar arches, and a dark streak).

In several articles on the aurora of November 17, 1882, the height of auroræ is spoken of. Mr. W. M. F. P. (p. 173) says that the strange object observed is *physically impossible* to auroral nature, because of its height of about 170 miles. It was already observed by Mr. Backhouse that auroræ are often observed at very great heights. The same is also the case with shooting stars. I take the liberty to refer once again to an article of mine in this journal entitled "The Height of the Aurora," where I refer to the beautiful determinations by Prof. Heis and Dr. Flögel, published in the *Zeitschrift der Oesterr. Gesellsch. f. Meteor.*, vii. p. 73. The heights were found from 10 to 100 geogr. miles (46 to 461 Engl. miles). Dr. Sophus Tromholt found, besides apparent low heights of some auroræ in Norway, the height of that of March 17, 1880, to be 17 geogr. miles ("Wochenschrift redigirt," von Dr. H. J. Klein, 1880, p. 172). Prof. Galle of Breslau calculated by his method, described in the *Zeitschr. f. Met.*, vii. p. 73, and in the *Astr. Nachrichten*, Bd. 79, No. 1882, 40 to 60 geogr. miles, and I found for the great aurora of May 13, 1862, 59 geogr. miles.

H. J. H. GRONEMAN

Groningen (Netherlands), January 14

NOTES

THE Council of the Institution of Civil Engineers have arranged for the delivery at the Institution of a series of six lectures, on the Applications of Electricity, on the following Thursday evenings, at 8 o'clock:—February 15—The Progress of Telegraphy, by Mr. W. H. Preece, F.R.S., M.Inst. C.E. March 1—Telephones, by Sir Frederick Bramwell, F.R.S., V.P.Inst., C.E. March 15—The Electrical Transmission and Storage of Power, by Dr. C. William Siemens, F.R.S., M.Inst. C.E. April 5—Some Points in Electric Lighting, by Dr. J. Hopkinson, F.R.S., M.Inst. C.E. April 19—Electricity applied to Explosive Purposes, by Prof. F. A. Abel, C.B., F.R.S., Hon. M.Inst. C.E. May 3—Electrical Units of Measurement, by Sir W. Thomson, F.R.S., M.Inst. C.E. This is an excellent step which the enterprising Institution has taken, and we are sure will be productive of good both to science and to engineering.

MR. ERNEST H. GLAISHER, B.A., Trinity College, Cambridge, has been appointed Curator of the British Guiana Museum, George Town, Demerara.

MR. W. H. WHITE, one of the Chief Constructors to the Navy, has resigned his position to take up a managerial appointment in the firm of Sir Joseph Whitworth.

AN interesting boring through the chalk is now about to be resumed at Southampton. At the last meeting of the British Association a paper by Mr. T. W. Shore and Mr. E. Westlake on the Artesian well on Southampton Common was read in the Geological Section. The Town Council has now accepted a tender for continuing the boring which was abandoned in 1851, after a depth of 1317 feet had been reached. The boring was then passing through the lower chalk or chalk marl, and we believe it is now intended to continue it to the Lower Greensand. The well at the bottom of which the boring commences is 563 feet deep, and this was reopened last week, after having been closed for thirty-two years. Some observations on the temperature of the water were at once made by Mr. T. W. Shore and Mr. J. Blount Thomas, of Southampton, for the Underground Temperature Committee of the British Association. By means of a heavy elongated sinking weight and a registering windlass, a thermometer was passed down the bore shaft to a depth of 1210 feet, when it was stopped by chalk mud. An outer case which was attached to the sinking weight was much scratched in passing through the Upper Chalk. A temperature of 71°·9 F. was registered at the bottom, that of the outer air being 49° F.

THE City of Neuchatel celebrated in the beginning of the present month the fiftieth anniversary of the foundation of its Natural History Society. The leader among its founders, who first met for the purpose on December 6, 1832, was Louis Agassiz.

THE biennial Hunterian oration will be delivered on Wednesday, February 14, at three o'clock, by the President of the College of Surgeons, Mr. Spencer Wells, in the theatre of that institution. The biennial festival will be given in the library the same evening, to which the president and vice-presidents have, as usual, invited several distinguished visitors.

THE Pontifical Academy of the Nuovi Lincei have appointed a Committee to take steps for the erection of a monument in Rome to the late eminent astronomer, Father Secchi. The monument will be of a meteorological character. The sculptor Prinzi has already made a model which combines convenience for arranging the meteorological apparatus with features recalling the work of Father Secchi. The statue of the astronomer crowns the monument, and among other emblematical figures will be one of Meteorology holding in one hand a gigantic barometer, which can be seen from a great distance, and another of Physics holding up to view an equally large thermometer.

THE rumour that the fragments of the unfortunate Mr. Powell's balloon have been found in the Sierra del Pedroso, in the far south of Spain, is too vague and incredible to deserve much attention.

AT the meeting of the Essex Field Club, to be held on Saturday evening next, January 27, the attention of the members and the public generally will be directed to the Bill about to be introduced into Parliament for the construction of a line of railway from Chingford to High Beach. In January, 1881, the Club, in conjunction with other Natural History Societies in and around London, strongly protested against any portion of Epping Forest being occupied by a Railway or other Company, to the prejudice of the provisions of the Epping Forest Act, and certainly no sufficient arguments or expressions of public opinion have since been brought forward in favour of the scheme. It is believed that the proposed line is quite unnecessary, as no part of the forest is more than two miles from a railway station, and moreover a railway and its concomitants could not fail to destroy the chief interest and charm of the district—its seclusion and naturalness; qualities of inestimable value so near a large city.

THE following papers are set down for reading at the meetings of the Society of Arts during the part of the Session after Christmas:—At the Ordinary Meetings—W. K. Burton, The Sanitary Inspection of Houses; General Rundall, The Suez Canal; Prof. Thorold Rogers, M.P., Ensilage in the United States; Sir Frederick Bramwell, F.R.S., Some Points in the Practice of the American Patent Office; J. H. Evans, The Modern Lathe; A. J. Hipkins, The History of the Pianoforte; Prof. George Forbes, The Electrical Transmission of Power;

D. Pidgeon, Recent Improvements in Agricultural Machinery; Wilfred Cripps, F.S.A., English and Foreign Silver Work, with some Remarks on Hall-marking. In the Foreign and Colonial Section—Edmond O'Donovan, Life among the Turkoman Nomads; Rev. J. Peill, "Social Conditions and Prospects in Madagascar; Robert W. Felkin, Egypt: Present and to Come; W. Delisle Hay, Social and Commercial Aspects of New Zealand. In the Applied Chemistry and Physics Section—C. F. Cross, F.C.S., Technical Aspects of Lignification; Walter G. McMillan, F.C.S., Chemical Means for Preventing or Extinguishing Fires; W. N. Hartley, F.R.S.E., Self-purification of River Waters; R. W. Atkinson, B.Sc., The Formation of Diastase from Grain by Moulds; James J. Dobbie, D.Sc., and John Hutchinson, On the Application of Electrolysis to Bleaching and Printing. In the Indian Section—Charles H. Lepper, Overland Commercial Communication between India and China, *viâ* Assam; W. S. Seton-Karr, Agriculture in Lower Bengal, with some Notice of Tenant Right, &c.; J. M. Maclean, Private Enterprise in India; C. Purdon Clarke, Some Notes on the Domestic Architecture of India.

WE have received from Egypt a publication of some interest in the shape of the *Bulletin* of the Chemical Laboratory at Cairo, directed by M. Albert Ismalun. The laboratory is under the Department of Public Works, and judging from the report in the *Bulletin* is doing a fair amount of useful work. The laboratory has been recently much improved, and attached is a museum of specimens in geology, palæontology, and zoology.

A CONSIDERABLE number of names has been added to the list of those who are unfavourable to the meeting of the British Association in Canada in 1884. The request of the protesters to the Council seems to us quite reasonable,—"that it is highly desirable that you should take some further steps in order to ascertain the general feeling of the members of the Association upon the subject, before allowing our kind and liberal friends in Canada to incur any further trouble or expense." There are 141 names appended to the circular, and while some of them are well known, still we note the absence of some of the leading representatives of English science.

THE proceedings at the meeting of the Association for the Improvement of Geometrical Teaching were not carried out quite on the lines laid down in a recent number of NATURE (vol. xxvii. p. 247). In consequence of a delay in the delivery of the copies of "the Elements of Plane Geometry," the President was obliged to defer the moving of his resolution till the next meeting, which, it is hoped, will be held about Easter next. The members were also informed that Mr. Levett had, in answer to an appeal made to him, consented to retain office as Hon. Secretary for the present year. Mr. E. B. Sargant, Trinity College, Cambridge, was elected to act as joint secretary with Mr. Levett. The following members were elected: Miss Burstall, Professors G. C. Foster, F.R.S., W. H. H. Hudson, H. Lamb, and G. M. Minchin, Rev. A. Jamson Smith, and Messrs. G. Griffith, E. B. Sargant, Charles Smith, F. Turner, and H. H. Turner.

DR. PEVERATI, director of the Meteorological Observatory of Cassine, states that an earthquake shock was felt there on January 16, at 7.42 a.m. (Roman time). The shock was undulating, preceded by a rumbling noise in the direction W.E., and lasted three-quarters of a second. The accompanying noise is compared to that of a very heavy body in motion in contact with another body at rest. The shock is classified as No. 3 in the scale of intensity proposed by Dr. Forel. A similar shock was felt the same day at Demonte (Cuneo) at 5.25 a.m., moving in a west-south direction. On the night of the 14-15th, several shocks were felt at Terranova and Pollino in Basilicata. Twenty-two shocks of earthquake were felt on January 16, at Centi, in the province of Murcia, Spain. Several houses were destroyed, but the inmates escaped unhurt. There was no loss of life.

IT is announced from Mexico, January 23, that a new comet near Jupiter has been discovered at the Puebla Observatory.

A NEW electrical paper *Electricity*, has issued its first number at Buda-Pesth. It is written in the Magyar language. The first paper of this description ever published was called *Les Archives de l'Electricité*, and was published by M. de la Rive at Geneva in 1840, and the first issued in England was edited by the late Mr. Walker in 1843, under the title, *Electrical Magazine*. None of these papers lasted for more than three or four years.

THE Algerian Government is preparing an expedition for next spring, in order to protect effectually the southern part of the province of Oran against incursions of the surrounding independent tribes. The results of this expedition are not without interest for English journals, many of which are printed on paper made from alfa, a plant cultivated in those remote regions, and manufactured in England. A curious fact is, that no French paper-maker ever attempts to manufacture alfa for inland consumption.

THE oases of the Beni-mzab Confederacy to the south of Algeria, have been annexed to the French Algerian possessions, and a military expedition has established a regular administration in the country. The Algerian section of the French Alpine Club is organising a scientific expedition which will leave shortly in order to take advantage of a favourable season for travelling. Any one wishing to take part in this excursion should communicate with M. Durando, president of the Algerian section. The newly-annexed oases are seven in number, with a population estimated at 40,000, with about 200,000 palm-trees under cultivation. The ruins of several large towns have been covered by sand.

TWO of the most important scientific expeditions which attempted to get into the Siberian seas last year were those in the *Dijmphna*, with Lieut. Hovgaard bent on reaching the North Pole, and the Dutch Meteorological Expedition in the *Varna*, bound for Port Dickson. These two vessels succeeded in forcing the ice in the Waigatz Straits in September last, and perhaps the *Dijmphna* would then have got through the Kara Sea, had she not, by mistaking certain signals, been led to leave the open "lead" in which she was, and gone to the assistance of the steamer *Louise*, beset by the ice. She was caught in the pack, as the *Varna* had previously been, and was frozen in on September 17. The last report which we possess from these vessels, is dated September 22, and was brought to Europe by Capt. Dallmann of the *Louise*. Since that date no news whatever has come to hand from the vessels, and the statements which have appeared in the Russian press relating to the discovery by Samoyedes of a wreck, supposed to have been that of the *Dijmphna*, south of Waigatz Island, have been proved to refer to an old Russian whaler, stranded there some years ago. Although the expedition, if it had met with any mishap, would undoubtedly have found its way to the mouth of the Petchora, of which we should have had information before now, it has been decided by the Danish Government to send out a search expedition, under Capt. Norman, from Siberia, in case the *Dijmphna* should be in want of anything. On the other hand the Swedish-Norwegian Consul at Arkangelsk reports under date of December 13, that fishermen who had visited Waigatz Island in November last, had not seen any vessel near that island. In the last message received from Lieut. Hovgaard he expressed the opinion that the ice in the Kara Sea would break up during the periodical storms in September and October, and enable him to reach Port Dickson, where he intended to winter. If to this is added the statements made by Mr. Leigh Smith and Sir Henry Gore Booth, as to open water north and east of Novaya Zemlya during the summer, it is not improbable that the *Dijmphna* has got free in October, and safely reached Port Dickson, or, perhaps, even Port Aktinia on the Taimur Island. Should this be the case, Lieut. Hovgaard has, no doubt, despatched a messenger to the nearest habitation, viz. Goltochicha, and thence by express to Jeniseisk, and we may therefore look forward to reassuring news from the gallant Danish explorer at the end of January or early in February.

THE results of a fourth years' observations of periodic movements of the ground as indicated by spirit levels at Secheron, are given by M. Ph. Plantamour in the *Archives des Sciences* of December 15. The curves obtained from the east-west spirit level, for the four years, are strikingly similar in the manner (pretty regular generally) in which they follow the thermal oscillations of the air. Different years show a notable difference in the epoch of maximum descent of the east side relatively to the minimum of mean temperature, and maximum rise of the same side relatively to the maximum of temperature. One is led to consider the maximum and minimum of temperature rather as accidents as regards the epoch at which they occur, and to attribute a preponderant influence to the distribution of mean temperatures during the four months November-February, and the four June September. Probably, too, the degree of moisture influences largely the rapidity with which the deeper ground layers are affected by exterior temperature. The curve for the north-south level is also very similar to the previous ones; but has this peculiarity, that while the south side follows, in general, from October 1 to the end of September, the oscillations of external temperature (descending in winter and rising in summer) the intermediate variations of temperature have an inverse effect. The cause is at present unknown. Col. van Orff's observations at Bogenhausen reveal oscillations of the ground similar to those at Secheron, only with greater amplitude south-north, and less east-west. M. Plantamour regrets that, excepting Col. van Orff and M. d'Abbadie, no one, so far as he knows, has undertaken observations of the kind at any other station. They are easily made, and should yield important results.

NEARLY thirty years ago, Poggendorff described a "fall-machine" of his invention. Its merits, according to Herr Bauer, who spoke warmly in commendation of it at a recent meeting of philologists and schoolmasters in Karlsruhe (*Wied. Ann.*, No. 13), appear to have been somewhat overlooked. Few physical cabinets have it, and the only text-book in which Herr Bauer has found it described is that of Reis. We may state that the two pulleys over which the cord runs are at the middle and one end of a balance beam, a weight being hung from the other end (with which, and a running weight, the beam can be rendered horizontal). The machine is supplied by Herr Karl Sickler in Karlsruhe.

THE *Nation* states that from Mr. Agassiz's annual report on the condition of the Museum of Comparative Zoology it learns that it is his intention, in connection with Prof. Faxon and Dr. Mark, to issue in the Museum Memoirs a "Selection from Embryological Monographs," containing quarto illustrations derived from innumerable scientific transactions and periodicals, and serving as an atlas for any text-book on embryology. By the purchase of the large Schary collection of Bohemian Silurian fossils, and by its own rich amassing in the West and South-west during the year, the museum now contains one of the finest collections of palæozoic fossil invertebrates in existence. Mr. Samuel Garman, whose explorations for mammalian remains in the Western Territories were very successful, was led to believe from the mode of their accumulation that the cause of extinction of the more recent was "a very severe winter, much more extensive and severe" than the occasional blizzards of our time. "As if from freezing, the shafts of the larger bones are generally splintered."

WE have received the *Annuaires* of the Bureau des Longitudes and of Montsouris Observatory, both of them abounding with useful information on many subjects. Gauthier-Villars is the publisher.

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus* ♂ ♂) from India, presented by Mr. J. Steel; a Black-footed Penguin (*Spheniscus demersus*) from South Africa, presented by Mr. John Wormald; a West Indian Rail (*Aramides cayennensis*) from West Indies, presented by Mr. E. H. Blomefield; an Orange-winged Dove (*Leptoptila ochroptera*) from Brazil, presented by Mr. C. A. Craven, C.M.Z.S.; a Long-eared Owl (*Asio otus*), British, presented by Mr. — Dyer; a Great Barbet (*Megalæma virens*), a Silky Starling (*Sturnus sericeus*), two Grey Thrushes (*Turdus cardis*), twelve Red-sided Tits (*Parus varius*) from Japan, a Crested Grebe (*Podiceps cristatus*), four Razorbills (*Alca torda*), a Red-throated Diver (*Colymbus septentrionalis*), British, purchased.

OUR ASTRONOMICAL COLUMN

THE GREAT COMET OF 1882.—The first determination of elliptical elements of this comet by Mr. S. C. Chandler, of Harvard Observatory, U.S., assigned a period of revolution of about 4000 years. Later investigations have diminished this period very considerably, though the length of revolution is not determined within narrow limits. Prof. Frisby, of Washington, employing observations on September 19, October 8, and November 24, gives a period of 794 years, and finds a close agreement between the position indicated by his orbit and the Cape ante-perihelion observation of September 8. Dr. Kreutz, of Berlin, using chiefly meridian observations or normal places from September 8 to November 14, gives 843 years, and finds a pretty close accordance with observation throughout this interval, thus showing no very material perturbation at perihelion passage. Further, Dr. Morrison, of Washington, founding his calculation upon positions for September 19, October 8, and December 11, finds a period of 652½ years. But while these later computations favour a shorter revolution than was at first attributed to the comet, there remains to be ascertained to what extent the abnormal form of the nucleus since the end of September has affected the observations, and hence the deduced elements of the orbit, and a much more complete discussion of the observations than has yet been attempted, when details respecting the point of the comet observed are before us, may be required before confidence can be placed in the result of any calculation. *Primâ facie* the elements assigned by Dr. Kreutz look satisfactory enough.

In view of a possible period of seven or eight hundred years, attention may be again directed to the comet of 1106, which had several characteristics favourable to identity, though the statement in several of the chronicles (chiefly English) that at the latter part of its appearance it was seen between the north and east, is not reconcilable therewith. Pingré, advocating the identity of the comet of 1106 with the great comet of 1680 (in which he followed Halley) rather questioned the authority of the *Chronicon Alberici, Trium-fontium Monachi*, that the tail extended "below the constellation Orion," which might have been the case if the comet were identical with either of the comets of 1843, 1880, or 1882; he remarked, the monk was "ni contemporain, ni exact, ni judicieux." This subject will deserve further attention, and we may return to it shortly.

THE WASHINGTON OBSERVATORY, U.S.—The first volume of "Publications of the Washington Observatory of the University of Wisconsin" has just been issued by the director, Prof. E. S. Holden, and augurs most favourably for the reputation of this institution, which was founded within the last five years through the liberality and scientific spirit of a private individual, the Hon. C. C. Washburn. The volume is especially